## REMARKS

By the present Amendment, claims 3, 20, 21, and 25 have been amended to more appropriately define the present invention. Applicant submits that no new matter has been added.

Claims 3, 12, 13, and 19-25 are currently under consideration, with claims 1, 2, 4-11, and 14-18 being withdrawn from consideration as directed to an nonelected invention. In the Final Office Action, the Examiner rejected claims 21-24 under 35 U.S.C. § 102(e) as being anticipated by Sakui et al.(U.S. Patent No. 6,239,495); rejected claims 3, 12, 13 and 19 under 35 U.S.C. § 103(a) as unpatentable over Sakui et al. in view of Iijima et al. (U.S. Patent No. 5,729,439); rejected claims 3, 12, 13, and 19 under 35 U.S.C. § 103(a) as being unpatentable over Sakui et al. in view of Komiyama (U.S. Patent No. 6,424,050); and rejected claims 20 and 25 under 35 U.S.C. § 103(a) as being unpatentable over Sakui et al. and Iijima et al. further in view of Hsuan et al. (U.S. Patent No. 6,236,109).

Applicant respectfully traverses the rejections of claims 3, 12, 13, and 19-25, as detailed above, for the following reasons.

### Rejection under 35 U.S.C. § 102(e)

Applicant respectfully traverses the rejection of claims 21-24 under 35 U.S.C. § 102(e) as being anticipated by Sakui et al. for the following reasons.

In order to properly anticipate Applicant's claimed invention under 35 U.S.C. § 102(e), the Examiner must show that each and every element of each of the claims in issue is found, either expressly described or under principles of inherency, in a single prior art reference. Furthermore, "[t]he identical invention must be shown in as complete detail as is contained in the ... claim." See M.P.E.P. §2131, page 2100-69, 8th

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Ed., August 2001, quoting *Richardson v. Suzuki Motor Co.*, 868 F.2d 1126, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989). Further, "the elements must be arranged as required by the claim." M.P.E.P. §2131, p. 2100-69.

Independent claim 21 recites a semiconductor device comprising, among other things, "a plurality of first connecting terminals ... a plurality of second connecting terminals ... and a portion of either the first connecting terminals or the second connecting terminals is distributed and arranged substantially on an entire surface of the semiconductor chip, and power source supply potential or ground potential is to be applied to said portion."

In the Advisory Action dated September 24, 2003, the Examiner alleges that "for claim 21, a portion (the bump 8-4 or 8-3) of the connecting terminals of Sakui clearly is arranged on the center area of the chip, and Vss (13a) in general, denoted as ground potential is connected to the bump 8-3 and for the bump 8-4, chip enable signal (CE) is connected to the bump 8-4, therefore, it is inherent that a power supply has to be APPLIED for proper operation." (emphasis in original.) Continuation Sheet of Advisory Action.

Applicant respectfully disagrees with the Examiner's allegations and conclusions because, as previously explained in the Request for Reconsideration filed on August 21, 2003, the bump 8-4, as shown in Fig. 3 of Sakui et al. is not connected to either a power source supply potential or a ground potential, as recited in claim 21. Instead, Sakui et al. discloses that the chip enable bar signals (CE), i.e., chip selection signal is provided through the bump 8-4. Therefore, Applicant disagrees with the Examiner's allegation that "it is inherent that a power supply potential has to be applied for proper operation."

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Applicant respectfully submit that Sakui et al. does not disclose at least "power source supply potential or ground potential is to be applied to said portion," as recited in claim 21. Sakui et al., in fact, teaches away from the present claimed invention because a chip enable bar signal is provided through the bump 8-4.

Moreover, if the Examiner is relying on his/her personal knowledge that is within the purview of one with ordinary skill in the art (which, the Examiner has not indicated), Applicant refers the Examiner to the February 21, 2002 Memorandum from USPTO Deputy Commissioner for Patent Examination Policy, Stephen G. Kunin, regarding "Procedures for Relying on Facts Which are Not of Record as Common Knowledge or for Taking Official Notice." In relevant part, the Memorandum states, "If the examiner is relying on personal knowledge to support the finding of what is known in the art, the examiner must provide an affidavit or declaration setting forth specific factual statements and explanation to support the finding" (Memorandum, p. 3). Applicant submits that "[d]eficiencies of the cited references cannot be remedied by ... general conclusions about what is "basic knowledge" or "common sense."" *In re Lee*, 61 USPQ2d 1430, 1432-1433 (Fed. Cir. 2002), quoting *In re Zurko*, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001). Should the Examiner maintain the rejection after considering the arguments presented herein, Applicant submits that the Examiner must provide "the explicit basis on which the examiner regards the matter as subject to official notice and [allow Applicant] to challenge the assertion in the next reply after the Office action in which the common knowledge statement was made" (Id. at 3, emphasis in original), or else withdraw the rejection.

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Furthermore, Applicant respectfully points out that "[i]nherency may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient to establish inherency." Scaltech, Inc. v. Retec/Tetra, L.L.C., 51 USPQ2d 1055, 1059 (Fed. Cir. 1999). Furthermore, the Federal Circuit Court has explained that "[u]nder the doctrine of inherency, if an element is not expressly disclosed in a prior art reference, the reference will still be deemed to anticipate a subsequent claim if the missing element *is necessarily present* in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." Rosco Inc v. Mirror Lite Co., 64 USPQ2d 1676, 1680 (Fed. Cir. 2002) (emphasis added). Further, "[t]he mere fact that a certain *may* result from a given set of circumstances is not sufficient to establish inherency." In re Rijckaert, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993).

In alleging that the element in claim 21 not disclosed in Sakui et al., is inherently disclosed by Sakui et al., the Examiner incorrectly assumes that a power supply must be *necessarily present*, that is a power supply must be applied to bump 8-4. However, the Examiner has failed to point to any reason to support this assumption apart from the alleged reason "for proper operation." Continuation Sheet of Advisory Action.

In summary, Sakui et al. does not, either expressly or inherently, disclose at least "a plurality of first connecting terminals ... a plurality of second connecting terminals ... and **a portion** of either the first connecting terminals or the second connecting terminals is distributed and arranged substantially on an entire surface of the semiconductor chip, and **power source supply potential or ground potential is to be applied to said porti n**," as recited in claim 21 (emphasis added). Therefore, the rejection of claim 21

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under 35 U.S.C. § 102(e) is improper and Applicant respectfully requests the Examiner to withdraw the rejection and the claim be allowed. Claims 22-24 are also allowable at least in view of their dependency from allowable claim 21.

**Rejection under 35 U.S.C. § 103(a)**

Applicant respectfully traverses the rejection of claims 3, 12, 13, 19, 20, and 25 under 35 U.S.C. § 103(a) because a *prima facie* case of obviousness has not been established by the Examiner.

In order to establish a *prima facie* case of obviousness, three basic criteria must be met. First, the prior art reference (or references when combined) must teach or suggest all the claim elements. Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify a reference or to combine reference teachings. Third, there must be a reasonable expectation of success. *See* M.P.E.P. § 2143.

**I. Claims 3, 12, 13, and 19 (Sakui et al. and Iijima et al.)**

On pages 2-4 of the Office Action, the Examiner rejected claims 3, 12, 13, and 19 under 35 U.S.C. § 103(a) as being unpatentable over Sakui et al. in view of Iijima et al.

Claim 3 recites a semiconductor device comprising, among other things, "a plurality of first connecting terminals ... a plurality of second connecting terminals ... and one of the first connecting terminals and the second connecting terminals are arranged to be facing to [an] assembly board and wherein the average density of arrangement of such thusly arranged connecting terminals is lower than that of other connecting terminals which are not thusly arranged."

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In the Advisory Action, the Examiner alleges that "claims clearly recite 'the average...of the one of the first connecting terminal and the second connecting terminals...' This indicates that one of the connecting terminal has fewer bumps than the other." Continuation Sheet of the Advisory Action. Applicant respectfully disagrees with the Examiner's characterization of the claim language. Even though Applicant believes that the Examiner has mischaracterized the language of the claim, Applicant has amended claims 3 and 20 to further clarify the invention.

Present independent claim 3 recites "one of the first connecting terminals and the second connecting terminals are arranged to be facing [an] assembly board and **wherein the average density of arrangement of such thusly arranged connecting terminals is lower than that of other connecting terminals which are not thusly arranged.**" (emphasis added). Applicants point out that the recitation "such thusly arranged connecting terminals" refers to the one of the first and second terminals that is arranged to be **facing to an assembly board.**

In contrast, Fig. 3 of Sakui et al. shows a connecting terminal layer with five bumps and another connecting terminal layer with seven bumps (8-1 through 8-7). If the Examiner is alleging that the bumps 8-1 through 8-7 correspond to the claimed "one of the ... terminals [that are] arranged to be facing to [an] assembly board," then those bumps must also have a lower density of arrangement than the other connecting terminal layer (the one with five bumps), which is simply not true.

Therefore, contrary to the Examiner's allegations, Sakui et al. does not teach or suggest at least "a plurality of first connecting terminals ... a plurality of second connecting terminals ... and one of the first connecting terminals and the second

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connecting terminals are arranged to be facing to [an] assembly board and wherein the average density of arrangement of such thusly arranged connecting terminals is lower than that of other connecting terminals which are not thusly arranged," as recited in claim 3.

Iijima et al., cited merely to show a flip-chip arrangement, fails to cure the deficiencies of Sakui et al., as noted above. Therefore, Sakui et al. and Iijima et al., either taken alone or in combination, fail to teach or suggest at least least "a plurality of first connecting terminals ... a plurality of second connecting terminals ... and one of the first connecting terminals and the second connecting terminals are arranged to be facing to [an] assembly board and wherein the average density of arrangement of such thusly arranged connecting terminals is lower than that of other connecting terminals which are not thusly arranged," as recited in claim 3.

Further, the Examiner alleges that "[i]t would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teaching of Iijima et al. to the device of Sakui et al to have a flip chip arrangement since a flip chip configuration provides a higher density and better performance for a device circuit." Applicant disagrees with the Examiner's allegations and conclusions as an unsubstantiated statement of questionable relevance to Applicant's claimed invention. Applicant further refers the Examiner to the February 21, 2002 Memorandum from USPTO Deputy Commissioner for Patent Examination Policy, Stephen G. Kunin, regarding "Procedures for Relying on Facts Which are Not of Record as Common Knowledge or for Taking Official Notice." In relevant part, the Memorandum states, "If the examiner is relying on personal knowledge to support the finding of what is known in

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the art, the examiner must provide an affidavit or declaration setting forth specific factual statements and explanation to support the finding" (Memorandum, p. 3). Further, the Memorandum indicates that the Federal Circuit has "criticized the USPTO's reliance on 'basic knowledge' or 'common sense' to support an obviousness rejection, where there was no evidentiary support in the record for such a finding." Id. at 1.

Applicant submits that "[d]eficiencies of the cited references cannot be remedied by the Board's general conclusions about what is "basic knowledge" or "common sense."" In re Lee, 61 USPQ2d 1430, 1432-1433 (Fed. Cir. 2002), quoting In re Zurko, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001). Should the Examiner maintain the rejection after considering the arguments presented herein, Applicants submit that the Examiner must provide "the explicit basis on which the examiner regards the matter as subject to official notice and [allow Applicants] to challenge the assertion in the next reply after the Office action in which the common knowledge statement was made" (Id. at 3, emphasis in original), or else withdraw the rejection.

Therefore, at least because Sakui et al. and Iijima et al., either taken alone or in combination, fail to teach or suggest each and every element of claim 3, the Examiner has failed to establish a *prima facie* case of obviousness for claim 3. Accordingly, the rejection of claim 3 is improper under 35 U.S.C. § 103(a), and Applicant respectfully requests the Examiner to withdraw the rejection of claim 3 and the claim allowed. Applicant submits that claims 12, 13, and 19 are also allowable at least in view of their dependency from allowable claim 3.

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**II. Claims 3, 12, 13, and 19 (Sakui et al. and Komiyama)**

On pages 4-5 of the Office Action, the Examiner rejected claims 3, 12, 13, and 19 under 35 U.S.C. § 103(a) as being unpatentable over Sakui et al. in view of Komiyama.

As discussed above regarding the rejection of claim 3, Sakui et al. does not teach or suggest at least "a plurality of first connecting terminals ... a plurality of second connecting terminals ... and one of the first connecting terminals and the second connecting terminals are arranged to be facing to [an] assembly board and wherein the average density of arrangement of such thusly arranged connecting terminals is lower than that of other connecting terminals which are not thusly arranged."

Komiyama fail to cure these deficiencies of Sakui et al. Komiyama discloses a flip chip IC chip with a mounting surface that is externally exposed and is provided with external terminals 15. See id. at Fig. 4. The Examiner alleges that Komiyama "clearly show[s] that the density of the conductive bumps arrangement is different between the first connecting terminals 15 and the second connecting terminals 24, 49 of the first chip 1 in Fig. 4." Office Action at page 5. Applicant respectfully disagrees. Without acceding to the Examiner's characterization of Komiyama, if one were to accept, for argument's sake, that terminals 15 correspond to the claimed "the one of ... terminals" that face an assembly board, then still, it is not true that they have an average density of arrangement that is lower than the terminals 24 and 49 (as shown in Komiyama). As can be clearly seen from Fig. 4, terminals 15 are spaced closer than the terminals 24 and 29, and, therefore, are not of a lower average density of arrangement.

Therefore, Sakui et al. and Komiyama, either taken alone or in combination, do not teach or suggest at least "a plurality of first connecting terminals ... a plurality of

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second connecting terminals ... and one of the first connecting terminals and the second connecting terminals are arranged to be facing to [an] assembly board and wherein the average density of arrangement of such thusly arranged connecting terminals is lower than that of other connecting terminals which are not thusly arranged," as recited in claim 3.

Further, the Examiner alleges that "[i]t would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the teaching of Komiyama to have a different number of conductive bumps for two connecting terminals in a flip chip configuration in order to have more compact arrangement to reduce a device size." Applicant disagrees with the Examiner's allegations and conclusions as an unsubstantiated statement of questionable relevance to Applicant's claimed invention. Applicant submits that "[d]eficiencies of the cited references cannot be remedied by the Board's general conclusions about what is "basic knowledge" or "common sense."" In re Lee, 61 USPQ2d 1430, 1432-1433 (Fed. Cir. 2002), quoting In re Zurko, 59 USPQ2d 1693, 1697 (Fed. Cir. 2001). Should the Examiner maintain the rejection after considering the arguments presented herein, Applicant submit that the Examiner must provide "the explicit basis on which the examiner regards the matter as subject to official notice and [allow Applicant] to challenge the assertion in the next reply after the Office action in which the common knowledge statement was made" (Id. at 3, emphasis in original), or else withdraw the rejection.

Further to demonstrating that combining the teachings of Sakui et al. with those of Komiyama would not have resulted in Applicant's claimed invention, Applicant respectfully submits that Sakui et al., in fact, teaches away from such a combination. In

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particular, Sakui et al. discloses a plurality of semiconductor chips of the *same structure* stacked one on another, and option circuits of each semiconductor chip are selected in accordance with the connecting pattern of the metal bumps provided between semiconductor chips. Id. at col. 5, lines 14-19 (emphasis added). Therefore, it would be inconsistent with the teachings of Sakui et al. to incorporate the teachings of Komiyama, which discloses an IC chip 2 mounted in flip-chip configuration and protruded electrodes 49 provided at specified portions of the conductive pattern 47, and are respectively connected to the protruded electrodes 24 formed on a main surface of the IC chip 2. Id. at col. 5, lines 1-11 and Fig. 4. In view of such teachings away, neither is there any motivation to combine the teachings of the references to result in the claimed invention, nor is there any reasonable expectation of success from doing so.

In summary, the Examiner has failed to establish a *prima facie* case of obviousness for claim 3. Accordingly, Applicant requests the Examiner to withdraw the rejection of claim 3 under 35 U.S.C. § 103(a) and the claim be allowed. Applicant submits that claims 12, 13, and 19 are also allowable at least in view of their dependency from allowable claim 3.

**III. Claims 20 and 25 (Sakui et al., Iijima et al., and Hsuan et al.)**

Claims 20 and 25 contain recitations similar to claims 3 and 21.

Specifically, claim 20 recites, *inter alia*, "one of the first connecting terminals and the second connecting terminals are arranged to be facing to [an] assembly board and wherein the average density of arrangement of such thusly arranged connecting terminals is lower than that of connecting terminals which are not thusly arranged."

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As discussed above regarding the rejection of claim 3, Sakui et al. and Iijima et al. either taken alone or in combination, do not teach or suggest at least the quoted element.

Hsuan et al., cited merely in an attempt to show chips of different sizes, does not cure these deficiencies of Sakui et al. and Iijima et al. Therefore, Sakui et al., Iijima et al., and Hsuan et al., either taken alone or in combination, do not teach or suggest each and every element of claim 20.

Claim 25 recites a semiconductor device comprising, among other things, "a portion of either the first connecting terminals or the second connecting terminals is distributed and arranged substantially on an entire surface of the semiconductor chip, and power source supply potential or ground potential is to be applied to said portion."

As discussed above regarding the rejection of claim 21, Sakui et al. does not teach or suggest at least "a portion of either the first connecting terminals or the second connecting terminals is distributed and arranged substantially on an entire surface of the semiconductor chip, and power source supply potential or ground potential is to be applied to said portion," as recited in claim 25.

Iijima et al, cited merely for a flip chip device, and Hsuan et al., cited merely for chips of different sizes, do not cure these deficiencies of Sakui et al. Therefore, Sakui et al., Iijima et al., and Hsuan et al., either taken alone or in combination, do not teach or suggest each and every element of claim 25.

Further, there is no motivation to combine the teachings of the cited references. As discussed above, there is no motivation to combine the teachings of Sakui et al. with those of Iijima et al. In addition, contrary to the Examiner's allegations and conclusions,

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there is no motivation to combine the teachings of Hsuan et al. with those of Sakui et al. Further to demonstrating that combining the teachings of Sakui et al. with those of Iijima et al. and Hsuan et al. would not result in Applicant's claimed invention, Applicants respectfully submit that Sakui et al., in fact, teaches away from such a combination. In particular, Sakui et al. discloses a plurality of semiconductor chips of the *same structure* stacked one on another, and option circuits of each semiconductor chip are selected in accordance with the connecting pattern of the metal bumps provided between semiconductor chips. Id. at col. 5, lines 14-19 (emphasis added). Therefore, it would be inconsistent with the teachings of Sakui et al. to incorporate chips of different sizes, as taught by Hsuan et al. into the device of Sakui et al. Absent such motivation, clearly there would be no reasonabe expectation of success.

Therefore, the Examiner has failed to establish a *prima facie* case of obviousness for claims 20 and 25. Accordingly, Applicant requests the Examiner to withdraw the rejection of claims 20 and 25 under 35 U.S.C. § 103(a) and the claims allowed.

**Conclusion**

In view of the foregoing remarks, Applicant respectfully requests reconsideration and reexamination of this application and the timely allowance of the pending claims.

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Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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Dated: October 29, 2003

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